AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior listing of claims for the present application.

1. (currently amended) A method of forming a contact opening in an insulative layer formed over a substrate in a semiconductor device, said method comprising:

etching said insulative layer with an etching composition consisting ~~essentially~~ of ammonia and at least one fluorocarbon so as to form said contact opening, wherein the flow rate ratio of said at least one fluorocarbon to said ammonia is from about 2:1 to about 40:1, and said flow rate of said ammonia is in the range from about 2 sccm to about 6 sccm.

2. (previously presented) The method of claim 1, wherein said method is performed to produce a self-aligned contact opening, said opening is self-aligned between two adjacent gate stack structures with side wall spacers.

3. (original) The method of claim 1, wherein said etching includes plasma etching.

4. (original) The method of claim 3, wherein said etching is performed within a temperature range of about -50 to about 80 degrees Celsius.

5. (original) The method of claim 4, wherein said etching is performed within a temperature range of about 0 to about 50 degrees Celsius.

6. (previously presented) The method of claim 4, wherein said etching is performed at an operating pressure of about 25 to about 60 milliTorrs.

7. (previously presented) The method of claim 4, wherein said etching is performed at an operating pressure of about 40 to about 50 milliTorrs.

8. (previously presented) The method of claim 1, wherein said etching is performed through a patterned photoresist mask.

9. (currently amended) The method of claim 1, wherein said at least one fluorocarbon is at least one member selected from the group consisting of fluorinated carbons, fluorohydrocarbons, chlorofluorocarbons and chlorofluorohydrocarbons.

10. (currently amended) The method of claim 9, wherein said at least one fluorocarbon is at least one member selected from the group consisting of C_4F_8, C_4F_6, C_5F_8, CF_4, C_2F_6, C_3F_8, CHF_3, and CH_2F_2.

11. (currently amended) The method of claim 10, wherein said at least one fluorocarbon is at least one member selected from the group consisting of CF_4, CHF_3, and CH_2F_2.

12. (original) The method of claim 1, wherein said method is performed without forming an etch stop.

13. (previously presented) The method of claim 2, wherein said side wall spacers remain unetched during formation of said self-aligned contact opening.

14. (canceled).

15. (currently amended) The method of claim 9, wherein said ~~fluorocarbon(s)~~ at least one fluorocarbon and said ammonia are flowed into a reaction chamber containing said semiconductor device such that the flow rate ratio of said at least one fluorocarbon to said ammonia is not less than about 3:1.

16. (original) The method of claim 15, wherein the flow rate ratio of said at least one fluorocarbon to said ammonia is within the range of about 3:1 to about 20:1.

17. (original) The method of claim 16, wherein said flow rate ratio is within the range of about 4:1 to about 10:1.

18. (currently amended) The method of claim 11, wherein said at least one fluorocarbon is at least two members selected from the group of CF_4, CHF3, and CH_2F_2.

19. (currently amended) The method of claim 18, wherein said ~~fluorocarbons comprise~~ at least one fluorocarbon comprises CF_4, CHF3, and CH_2F_2.

20. (currently amended) The method of claim 11, wherein said at least one fluorocarbon is CF_4 which is flowed into a reaction chamber at a flow rate of about 15 to about 20 sccm.

21. (previously presented) The method of claim 18, wherein said CF_4 is flowed into a reaction chamber at a flow rate of about 18 sccm.

22. (currently amended) The method of claim 11, wherein said at least one fluorocarbon is CHF_3 which is flowed into a reaction chamber at a flow rate of about 35 to about 45 sccm.

23. (previously presented) The method of claim 22, wherein said CHF_3 is flowed into a reaction chamber at a flow rate of about 40 sccm.

24. (currently amended) The method of claim 11, wherein said at least one fluorocarbon is CH_2F_2 which is flowed into a reaction chamber at a flow rate of about 10 to about 15 sccm.

25. (previously presented) The method of claim 24, wherein said CH_2F_2 is introduced at a flow rate of about 13 sccm.

Claims 26-35 (canceled).

36. (currently amended) A process for forming an opening in an insulative layer formed over a substrate in a semiconductor device, said process comprising:

forming a pair of adjacent gate stacks over said substrate;

forming sidewall spacers on sidewalls of said adjacent gate stacks;

forming an insulative layer over said substrate;

forming a patterned photoresist mask layer over said insulative layer; and,

etching an opening in said insulative layer defined at least in part by said sidewall spacers through an aperture in said patterned resist layer, wherein said opening is etched through to said substrate using a combination consisting essentially of ammonia and at least one fluorocarbon, wherein said at least one fluorocarbon is selected from the group consisting of C_4F_8, C_4F_6, C_5F_8, CF_4, C_2F_6, CHF_3, CH_2F_2 and C_3F_8, and wherein the flow rate ratio of said at least one fluorocarbon to said ammonia is from about 2:1 to about 40:1, and wherein the step of etching an opening in said insulative layer forms a protective layer on said sidewall spacers that is from about 5 to about 50 Å thick.

37. (previously presented) The method of claim 36, wherein said etching is performed to produce a self-aligned contact opening in said insulative layer, said opening is self-aligned between said adjacent gate stack structures with sidewall spacers.

38. (original) The process of claim 36, wherein said etching is performed in a reaction chamber.

39. (currently amended) The process of claim 38, wherein said at least one fluorocarbon and said ammonia are flowed into said reaction chamber such the flow rate ratio of said at least one fluorocarbon to said ammonia is not less than about 3:1.

40. (canceled)

41. (previously presented) The process of claim 36, wherein said flow rate ratio is within the range of about 4:1 to about 10:1.

42. (original) The process of claim 36, wherein said etching is performed without forming an etch stop.

43. (previously presented) The process of claim 42, wherein said opening is formed between said sidewall spacers on said pair of adjacent gate stacks.

44. (original) The process of claim 43, wherein said etching is performed at a temperature within the range of about -50 to about 80 degrees Celsius.

45. (original) The process of claim 44, wherein said etching is performed at a temperature within the range of about 0 to about 80 degrees Celsius.

46. (original) The process of claim 45, wherein said method further comprises removing said photoresist mask layer after said etching.

Claims 47-63 (canceled).

64. (previously presented) A method of forming a conductive plug between adjacent gate stacks with sidewall spacers and inside a self-aligned contact opening

formed in an insulative layer provided over a substrate in a semiconductor device, said method comprising:

contacting said insulative layer with a plasma etchant mixture consisting essentially of ammonia and at least one fluorocarbon at a temperature within the range of from about -50 to about 80 degrees Celsius so as to form a self-aligned contact opening defined at least in part by said sidewall spacers on adjacent gate stacks in said insulative layer without an etch stop, wherein said contacting further forms a protective layer over opposed sidewall spacers which have been formed over said adjacent gate stacks that is from about 5 to about 50 Å thick, wherein the flow rate ratio of said at least one flurocarbon to said ammonia is from about 2:1 to about 40:1, and said flow rate of said ammonia is at least about 2 sccm; and,

depositing a conductive plug inside said etched opening such that said conductive plug is separated from said sidewall spacers by said protective layer.

65. (original) The method of claim 64, wherein said contacting is performed by flowing said ammonia over said device in a reaction chamber at a flow rate within the range of about 2 sccm to about 6 sccm.

66. (currently amended) The method of claim 64, wherein said at least one fluorocarbon is at least one member selected from the group consisting of C_4F_8, C_4F_6, C_5F_8, CF_4, CHF_3, and CH_2F_2 and is flowed over said device at a flow rate within the range of about 10 sccm to about 45 sccm.

67. (original) The method of claim 66, wherein said mixture comprises at least two fluorocarbons and said flow rate ratio of each said fluorocarbon to said ammonia is within the range of about 3:1 to about 20:1.

68. (original) The method of claim 67, wherein said mixture comprises three fluorocarbons and said flow rate ratio is within the range of about 4:1 to about 10:1.

69. (original) The method of claim 64, wherein said protective layer is a nitrogen containing layer.

70. (original) The method of claim 64, wherein said temperature is a pedestal temperature and said range is from about 0 to about 50 degrees Celsius.